REMARKS

Applicant respectfully requests the Examiner's reconsideration of the present application as amended.

Claims 1-55 are pending in the present application.

Claims 1-55 are rejected under 35 U.S.C. §102(b) as being unpatentable over U.S. Patent 6,349,402 ("Lin").

Claims 1, 9, 33, and 48 have been amended.

New claims 56-61 have been added.

Support for amended claims 1, 33, and 48, and new claims 56-61 is found on pages 4-28 of the specification, Figures 1-8(k) of the drawings, and claims 1-55 as originally filed. No new matter has been added.

The Examiner has rejected claims 1-55 under 35 U.S.C. §102(b) as being anticipated by Lin. In particular, the Examiner has stated that

> As to claims 1, and 33, Lin Kuoching teaches a method for designing a system, comprising: determining minimum and maximum delay budgets for connections by finding a set of connection delays that attempt to satisfy the short-path and long-path timing constraints (see fig Fig.4, fig 5 col 3 line 44 to col 5 line 24, Especially, col 4 lines 50-67); and selecting routing resources for the connections in response to the minimum and maximum delay budgets (see fig 1, 4, 5, col. 2 line 37 to col 3 line 31 and col. 5 lines 25 to col 6 line 51).

(2/23/2006 Office Action, p. 2)

As stated above, claims 1, 33, and 48 have been amended.

It is submitted that Lin does not render claims 1-61, as amended, unpatentable under 35 U.S.C. §102(b).

Lin includes a disclosure of a method to optimize differential pairs, based on timing constraints, includes recognizing that two separate traces form a differential pair, and combining sections of the differential pair into one or more trunks. Then, a

propagation delay is determined over the differential pair. The determined propagation delay is compared to a timing constraint for the differential pair. If the timing constraint is not met, a length of one or more of the trunks is adjusted and the propagation delay is redetermined and compared to the timing constraint. If the timing constraint is still not met, the process is repeated until the timing constraint is met or until the timing constraint cannot be met. If the timing constraint is eventually met, the one or more trunks are used to produce an adjusted differential pair (see Lin Abstract).

It is submitted that Lin does not teach or suggest determining minimum and maximum delay budgets for connections along a path by finding a set of connection delays that satisfy short-path and long-path timing constraints for the path, and selecting routing resources for the connections in response to the minimum and maximum delay budgets.

On the contrary, Lin discloses determining a propagation delay over a differential pair, comparing the propagation delay over the differential pair to a timing constraint for the differential pair, and adjusting the length of one or more trunks if the timing constraint is not met (see col. 1, line 60 through col. 2, line 2, and col. 4, lines 24-25, and 50-54). The propagation delay over the differential pair and the timing constraint for the differential pair is a measurement of timing over the entire pair, not connections along the pair. For example, Figure 5A-C of Lin illustrates that the propagation delay over a differential pair is determined by accumulating the delay introduced by trunk 530' and connectors 520' and 525 which makes up the entire path. This propagation delay is then compared to the timing constraint for the differential pair (see col. 6, lines 58-67). A minimum and maximum delay budget is not determined for area 535A or 540B shown in Figure 5B. Lin discloses comparing propagation delay over the entire differential pair to a timing constraint for the entire differential pair, not for areas along the differential pair. Applicants submit that Lin does not teach or suggest

determining minimum and maximum delay budgets *for connections along a path* and selecting routing resources *for the connections in response to the minimum and maximum delay budgets.*

In contrast, amended claim 1 as amended states

> A method for designing a system, comprising:
> determining minimum and maximum delay budgets for connections along a path by finding a set of connection delays that satisfy short-path and long-path timing constraints for the path; and
> selecting routing resources for the connections in response to the minimum and maximum delay budgets

(Claim 1 as amended) (Emphasis added).

Claims 33, and 48, as amended, include similar limitations. Given that claims 2-32, 52-8, depend directly or indirectly from claim 1 as amended, claims 34-47 depend directly or indirectly from claim 33 as amended, and claims 49-51 depend directly or indirectly from claim 48 as amended, it is likewise submitted that claims 2-32, 34-47, and 49-58 are also patentable under 35 U.S.C. §102(b) over Lin.

It is submitted that Lin does not teach or suggest finding a set of connection delays that satisfy short-path and long-path timing constraints for a path, wherein the short-path and long-path timing constraints are provided by a user.

On the contrary, Lin discloses that the timing constraint for a differential pair depends upon the circuit in which the differential pair is used (see col. 3, lines 19-21).

In contrast, amended claim 7 states

> The method of Claim 1, wherein the short-path and long-path timing constraints are provided by a user.

(Claim 7) (Emphasis added).

Claim 39 includes similar limitations.

It is submitted that Lin does not teach or suggest determining minimum and maximum delay budgets for the connections by allocating short-path and long-path slack.

The Examiner cites Figure 4 and 5, and column 3, line 44 to column 5, line 24 as evidence that Lin teaches "determining minimum and maximum delay budgets for the connections comprises allocating short-path and long-path slack" (2/23/06 Office Action, p. 3). Applicants submit that the cited sections by the Examiner do not disclose the allocation of short-path or long-path slack. In fact, Applicants could not find any disclosure or mention of short-path and long-path slack in the entire Lin reference.

In contrast, claim 8 states

> The method of Claim 1, wherein determining minimum and maximum delay budgets for the connections comprises allocating short-path and long-path slack.

(Claim 8) (Emphasis added).

Claim 40 includes similar limitations. Given that claims 9-18 and claims 41-42 depend directly or indirectly on claims 8 and 40, it is likewise submitted that claims 9-18 and 41-42 are also patentable under 35 U.S.C. §102(b) over Lin.

It is submitted that Lin does not teach or suggest re-selecting routing resources for connections that are shorted.

The Examiner cites Figure 4, Figure 5, column 3, line 44 through column 5 line, 24 as evidence that Lin teaches "wherein selecting routing resources for connections in response to the minimum and maximum delay budgets comprises re-selecting the routing resources for connections that are shorted" (2/23/06 Office Action, p. 6). Applicants submit that the cited sections by the Examiner do not disclose re-selecting routing resources for connections that are shorted. In fact, Applicants could not find any disclosure or mention of shorted connections in the entire Lin reference.

In contrast, claim 20 states

> The method of Claim 1, wherein selecting routing resources for connections in response to the minimum and maximum delay budgets comprises re-selecting the routing resources for connections that are shorted.

(Claim 20) (Emphasis added).

Claim 40 includes similar limitations.

It is submitted that Lin does not teach or suggest decreasing minimum delay budgets based on the number of routing iterations that have occurred.

The Examiner cites Figure 4, Figure 5, column 3, line 44 through column 5, line 24 as evidence that Lin teaches "decreasing minimum delay budgets based on the number of routing iterations that have occurred" (2/23/06 Office Action, p. 6). Applicants submit Lin discloses that the timing constraint depends upon the circuit in which the differential pair is used (see col. 3, lines 19-21). The cited sections by the Examiner do not disclose adjusting the timing constraint.

In contrast, claim 21 states

> The method of Claim 1, wherein selecting routing resources for connections in response to the minimum and maximum delay budgets comprises decreasing minimum delay budgets based on the number of routing iterations that have occurred.

(Claim 21) (Emphasis added).

Claim 45 includes similar limitations.

It is submitted that Lin does not teach or suggest increasing maximum delay budgets based on the number of routing iterations that have occurred.

The Examiner cites Figure 4, Figure 5, column 3, line 44 through column 5, line 24 as evidence that Lin teaches "decreasing minimum delay budgets based on the number of routing iterations that have occurred" (2/23/06 Office Action, p. 6). Applicants submit Lin discloses that the timing constraint depends upon the circuit in which the differential pair is used (see col. 3, lines 19-21). The cited sections by the Examiner do not disclose adjusting the timing constraint.

In contrast, claim 22 states

> The method of Claim 1, wherein selecting routing resources for connections in response to the minimum and maximum delay budgets comprises increasing maximum delay budgets based on the number of routing iterations that have occurred.

(Claim 22) (Emphasis added).

Claim 46 includes similar limitations.

It is submitted that Lin does not teach or suggest selecting routing resources for connections in response to the minimum and maximum delay budgets by utilizing a cost function.

The Examiner cites Figure 4, Figure 5, column 3, line 44 through column 5, line 24 as evidence that Lin teaches "selecting routing resources for connections in response to the minimum and maximum delay budgets comprises utilizing a cost function" (2/23/06 Office Action, p. 6). Applicants submit that the cited sections by the Examiner do not disclose utilizing a cost function for selecting routing resources. In fact, Applicants could not find any disclosure or mention of utilization of a cost function in the entire Lin reference.

In contrast, claim 23 states

> The method of Claim 1, wherein selecting routing resources for connections in response to the minimum and maximum delay budgets comprises utilizing a cost function.

(Claim 23) (Emphasis added).

Claim 47 includes similar limitations. Given that claims 24-32, depend directly or indirectly from claim 23, it is likewise submitted that claims 24-32 are also patentable under 35 U.S.C. §102(b) over Lin.

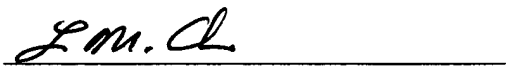
It is submitted that Lin also does not teach or suggest utilizing short-path timing constraints such as hold time requirements, minimum propagation delays, and minimum clock-to-output requirements. New claims 56-61 include some of these limitations.

In view of the amendments and arguments set forth herein, it is respectfully submitted that the applicable rejections and have been overcome. Accordingly, it is respectfully submitted that claims 1-55, as amended, and new claims 56-61 should be found to be in condition for allowance.

If any additional fee is required, please charge Deposit Account No. 50-1624.

Respectfully submitted,

Dated: May 19, 2006



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